

Sept. 2, 1958

C. B. HOUSEWORTH

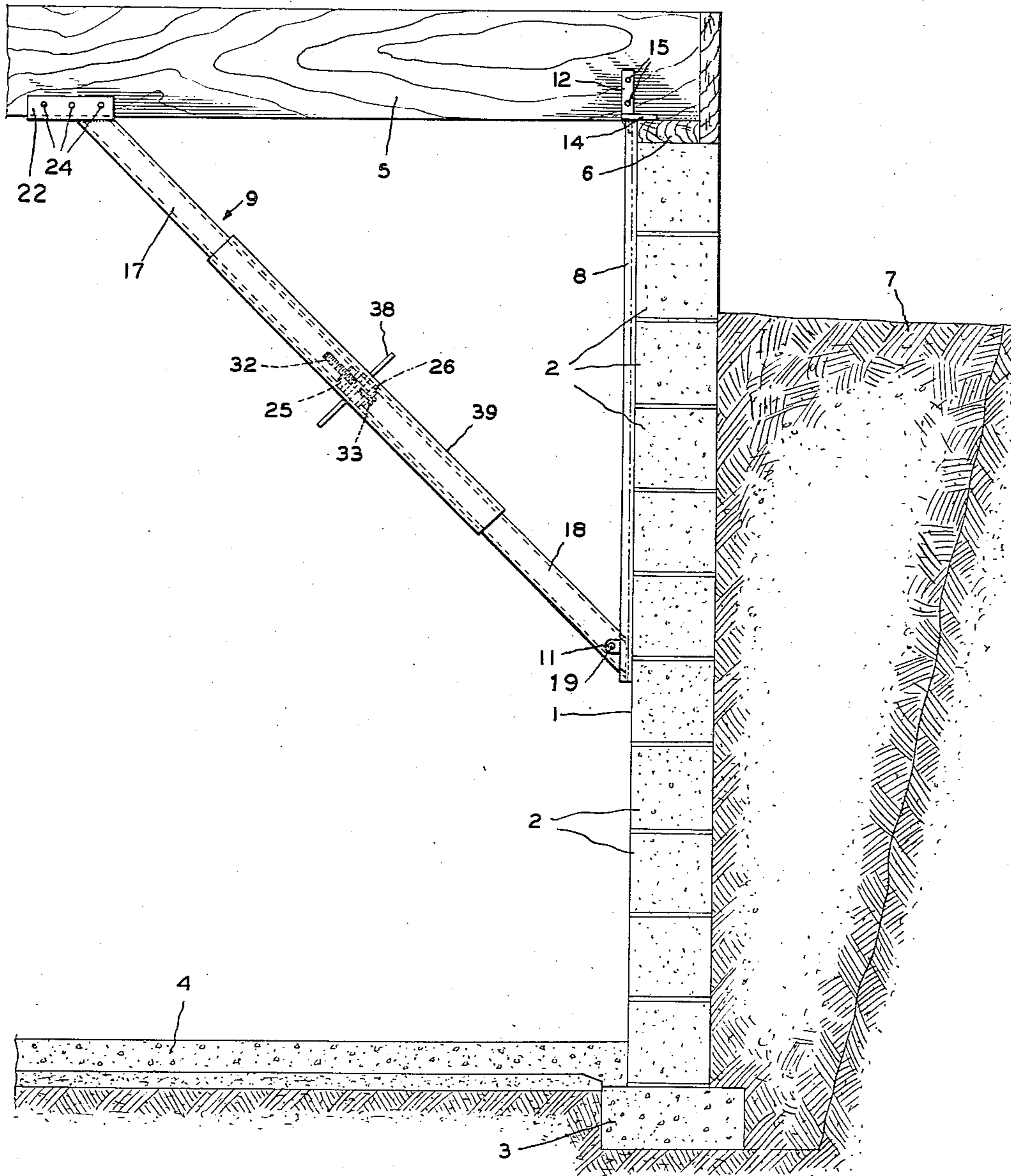
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WALL AND FLOOR SUPPORTING JACK

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3 Sheets-Sheet 1

FIG. 1.



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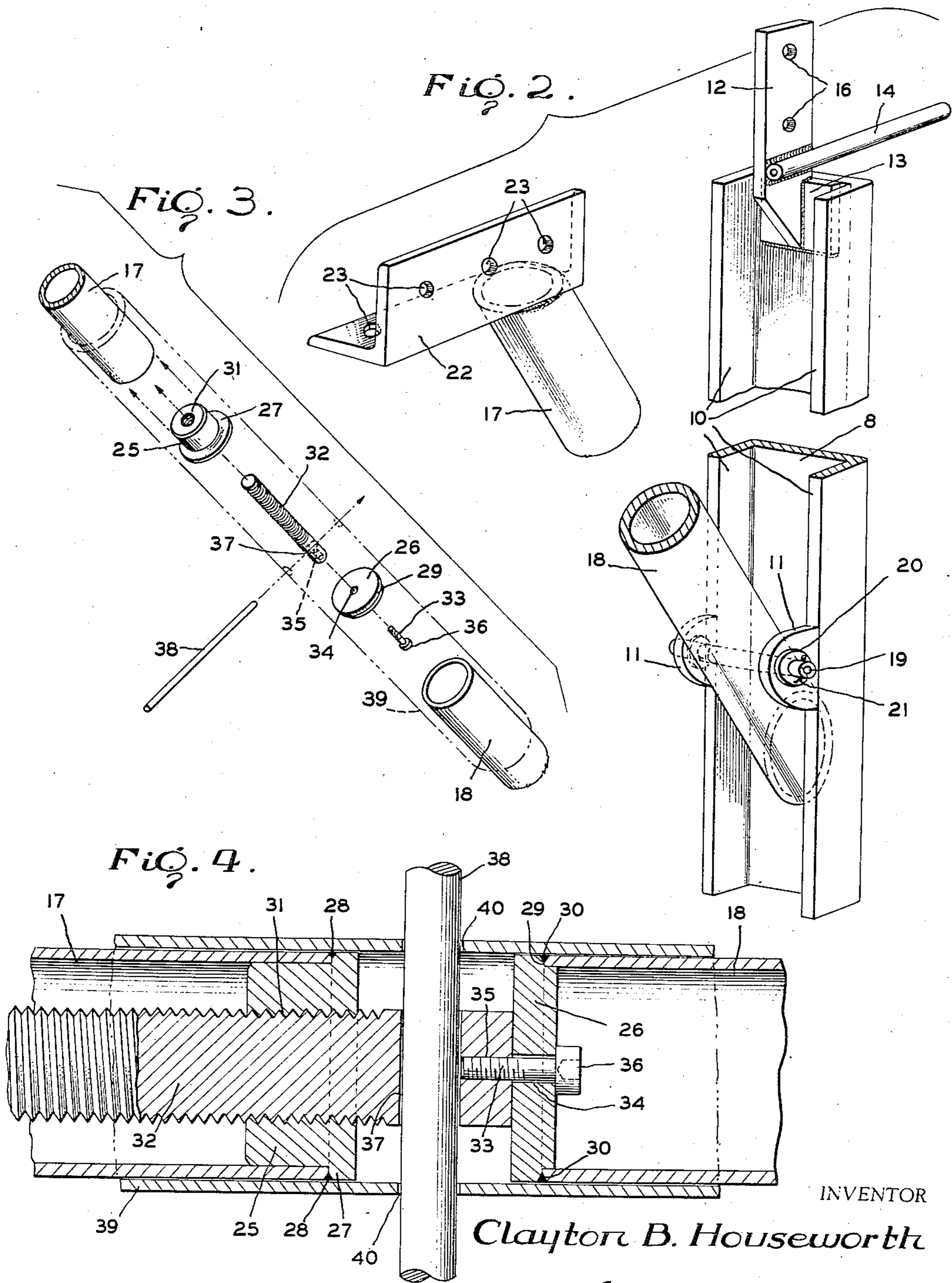
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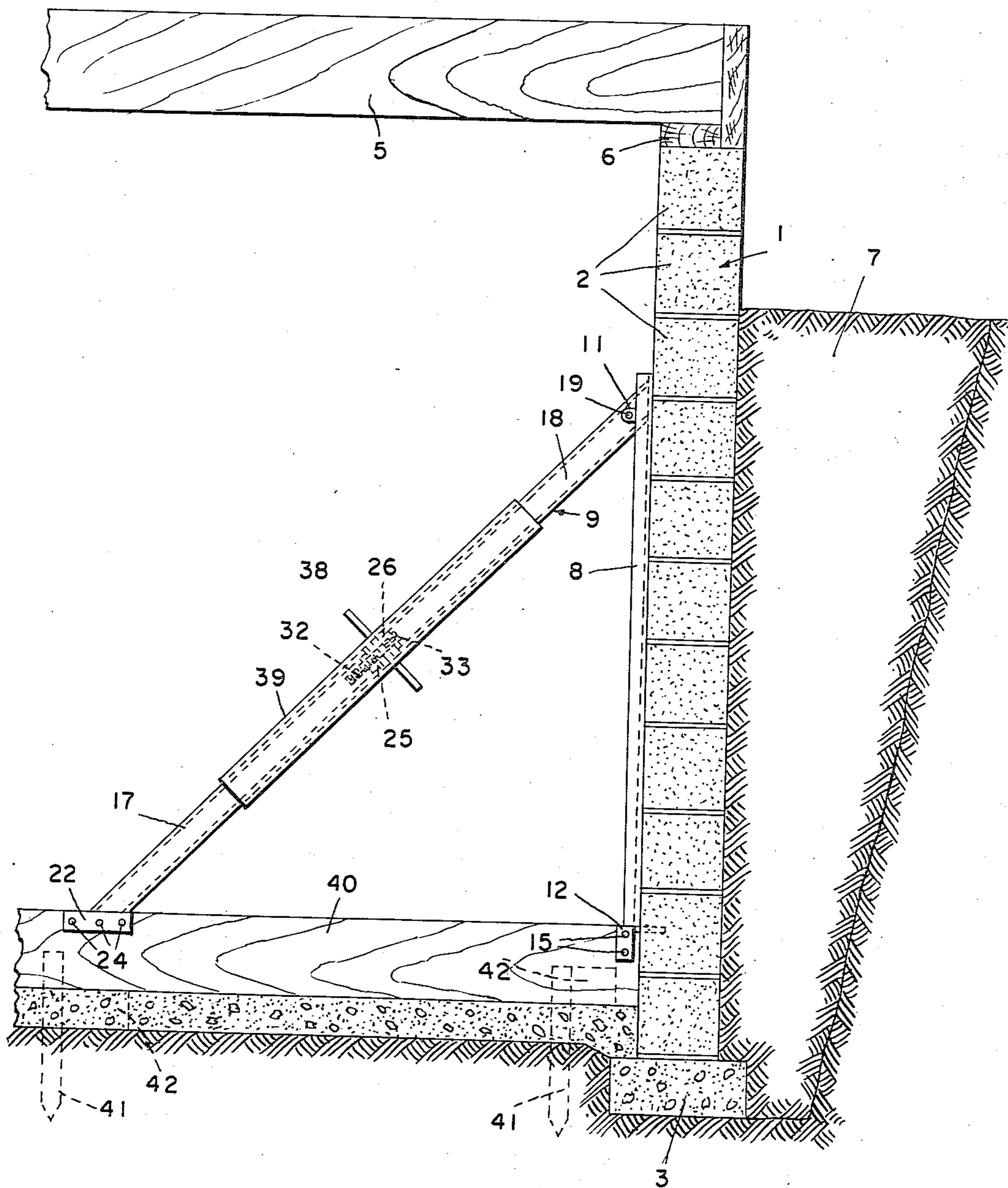
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*Fig. 5.*



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## WALL AND FLOOR SUPPORTING JACK

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5 Claims. (Cl. 248—354)

This invention relates to an improved wall and floor supporting jack which is intended for use either during the erection of a building or as a brace for exerting outward thrust upon a building wall which has started to bulge inwardly or as means for applying upward pressure to a floor joist and thus eliminate sag in a floor of an old building.

When a building is being erected, the foundation or cellar portion of a wall is often formed of cinder blocks or other wall material and when dirt is dumped into space along the wall to form a back fill, inward pressure is exerted by this dirt and water and tends to force the blocks inwardly out of their proper positions in which they form a perpendicular wall and thus weaken the wall and in some instances cause the blocks to budge inwardly to such an extent that the wall is liable to collapse.

It is, therefore, one object of the invention to provide a jack of such construction that it may be mounted within the cellar portion of a building and suspended in such position that it will apply outward pressure to a number of tiers of blocks and thus very effectively prevent inward bulging of the blocks, it being understood that a number of the improved jacks may be used and each mounted directly under a floor joist with which it cooperates when a brace forming an element of the jack is extended and thus serve to prevent the floor joist with which it is associated from sagging as well as bracing the wall against inward bulge.

Another object of the invention is to provide a jack having a vertically disposed wall engaging member or bar having at its upper end means for suspending the bar from a wall plate and also for securing the bar to an end portion of a floor joist and thus firmly mount the bar in a vertical position against the inner surface of the wall, but allow it to be very easily removed when use of the jack is no longer necessary.

Another object of the invention is to provide the improved jack with a brace which extends at an upward incline from the lower end of the wall engaging bar, the upper end of the brace being adapted to be secured in position for abutting engagement with the lower edge face of a floor joist at some distance from the floor engaging end of the joist and thus allow pressure to be applied to the floor joist and to the lower end of the wall engaging bar when the brace is extended longitudinally.

It is another object of the invention to provide the brace with improved tensioning means mounted between confronting inner ends of upper and lower sections of the brace and thus permit the sections of the brace to be forced away from each other and desired pressure applied to a floor joist and to the lower end of the wall engaging bar.

Another object of the invention is to provide an improved brace wherein a sleeve fits about the upper and lower sections of the brace to reinforce these sections and hold them in longitudinal alignment with each other, the sleeve being provided with diametrically extending aligned openings so that an operating rod may be passed

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through the sleeve and through an opening formed in a threaded shaft constituting an element of the tightening means for the brace and allow the two sections of the brace to be forced away from each other while the sleeve is still in place about these sections.

Another object of the invention is to provide a jack including a wall engaging bar and a brace which has its lower end pivotally connected with the lower end of the bar so that the brace may be moved to a folded position close against the bar and thus so positioned that the jack will occupy a small amount of space when folded and may be readily transported from one place to another and also conveniently stored when not in use.

Another object of the invention is to provide an improved jack consisting of a wall engaging bar and a brace, the bar being formed of channeled metal and the brace being of tubular formation, the formation of the bar and the brace adding strength to the jack and preventing the bar or the brace from being bent when subjected to strains.

With these and other objects in view, the improved jack is of a special construction illustrated in the accompanying drawings wherein:

Fig. 1 is a view showing a portion of a building in vertical section and a jack of the improved construction applied in position for use;

Fig. 2 is a foreshortened view showing the improved jack in perspective;

Fig. 3 is an exploded view showing the elements of the pressure applying device of the brace in perspective;

Fig. 4 is a fragmentary view upon an enlarged scale showing portions of the upper and lower sections of the brace and the pressure applying means in section; and

Fig. 5 is a view similar to Fig. 1 showing the jack in an inverted position.

This improved jack may be used for preventing inward bulging of a wall of a building or for removing sag from a floor and in Fig. 1 there has been shown a wall 1 which consists of a plurality of tiers or courses of blocks 2 which may be cinder blocks or formed of other suitable material. This wall which forms the lower portion of a building wall and may be referred to as a cellar wall, is erected upon a footing 3 formed of concrete and within the cellar is provided a cement floor 4. A suitable number of floor joists 5 extend between the side walls of the cellar which are both of the same construction, and these floor joists have their ends resting upon sill plates 6, one of which is provided for each wall.

After a cellar wall has been erected, dirt is dumped into the foundation which is dug to accommodate the building and thus form a back fill 7 which increases in width towards its top and from an inspection of Fig. 1 it will be seen that this dirt will exert considerable pressure against the outer surface of the wall and is liable to cause the blocks to bulge inwardly if cement between the blocks has not properly hardened, especially when wet from rain, etc. Sometimes the cement between the blocks of an old building will disintegrate and thus allow the pressure of dirt to force the blocks inwardly to such an extent that the wall is weakened and there will be danger of the wall collapsing if not repaired and braced to eliminate the bulging and prevent additional bulging of the wall.

In order to prevent or eliminate this bulging the improved jack constituting the subject matter of this invention is applied as shown in Fig. 1. This jack consists briefly of a vertically disposed wall engaging member or bar 8 and a brace which is indicated in general by the numeral 9. The wall engaging member or bar 8 is formed of strong metal and may be thick sheet metal such as steel or the like. This bar is of channeled formation and has side flanges 10 which extend the full length

of the bar. Near the lower end of the bar the side flanges 10 are formed with ears 11 which are disposed in opposed relation to each other at opposite sides of the bar. At its upper end the bar carries an upwardly projecting anchoring strip 12 having a base portion 13 which is welded to the inner surface of the bar and close to the upper end of the bar the anchoring strip carries a suspending pin 14 which is formed of metal such as cold rolled steel and is welded against a side face of the strip 12 in such position that it projects laterally from the outer side or working face of the bar. This suspending pin rests upon the upper surface of the sill plate 6 and when nails 15 are driven through the openings 16 into the side face of the floor joist against which the strip 12 bears, the wall engaging member or bar will be suspended in a vertical position flat against the inner surface of the wall. The length of the bar is such that it extends downwardly across a plurality of tiers or courses of blocks and as the length of the bar is more than half the height of the wall, the blocks will be very effectively braced against inward bulging by the pressure of the back fill. When the nails 15 are removed the bar will be freed and may be readily lifted away from the wall and thus removed.

The brace which holds the wall engaging bar firmly against the inner surface of the wall has an outer section 17 and an inner section 18. Each of these sections is formed of strong metal tubing and the inner end of the section 18 is cut diagonally so that when the brace is in the position shown in Figs. 1 and 2 the inner end of the section 18 may have flat contacting engagement with the inner surface of the bar between the flanges 10. An opening is formed diametrically through the inner section of the brace to receive a fastener such as the cold rolled steel pin 19 which is of such length that when it is applied its end portions will pass through openings in the ears 11 and project beyond the ears a sufficient distance to permit washers 20 to be applied and also cotter keys 21 which pass through aligned openings formed transversely through the pin near its ends. The brace will, therefore, be pivotally connected with the lower end of the wall engaging bar and may be swung to a folded position in which it extends close to the wall engaging bar longitudinally thereof. The jack may thus be reduced to a compact mass which may be readily stored when not in use and also readily transported from one place to another.

At its outer free end the outer section 17 of the brace carries a bracket 22 which is also formed of strong steel angle iron. The bracket is substantially V-shaped as shown in Fig. 2, and has its flanges formed with openings 23 so that nails 24 may be passed through the openings and driven into the floor joist where it is firmly but removably secured as shown in Fig. 1. The flanges of the bracket engage the side face of the floor joist and the lower edge face thereof and when the brace is longitudinally adjusted to exert pressure upon the lower end of the wall engaging bar and to the floor joist, the floor joist will be braced against downward sagging or sag in a floor joist may be eliminated in an old building when necessary.

In order to force the inner and outer sections of the brace away from each other and thus apply pressure to the bar 8 and the floor joist, there has been provided pressure applying means consisting briefly of one adjusting nut 25 and one pressure pad 26. The adjusting nut 25 fits into the lower end of the upper section 17 of the brace until the end edge of the brace engages the outstanding flange 27 of this adjusting nut where it is firmly secured by welding as shown at 28. The pressure pad 26 which is thinner than the adjusting nut 25 fits into the outer end of the inner brace section 18 until this end of the inner brace section has abutting engagement with the flange or shoulder 29 and the pad is then secured by welding as shown at 30. A threaded bore 31 is formed

through the adjusting nut 25 centrally thereof to receive a threaded shaft or screw 32 and in order to rotatably connect this shaft with the pad 26 there has been provided a screw 33 which is passed through an opening 34 formed in the pressure pad centrally thereof before the pad is welded to section 18 and screwed into a threaded opening 35 leading from an end of the shaft 32. Since the head 36 of the screw bars against the inner end face of the pressure pad 26, with slight clearance, the shaft 32 will be held in engagement with the pressure pad but the shaft may be turned relative to this pad.

A larger unthreaded opening 37 is formed through the shaft diametrically thereof adjacent its end in which the threaded opening or socket 35 is formed in order to accommodate an actuating rod 38 which is of sufficient length to project quite a distance from opposite sides of the brace and may be readily slid longitudinally through the opening 37 and thus enable it to be used as a handle for turning the threaded shaft. When the threaded shaft is turned in the proper direction it is moved longitudinally through the adjusting nut 25 and as an end of the shaft has abutting engagement with the pad 26, the two sections of the brace will be forced away from each other and pressure exerted upon the end of the wall engaging bar 8 which is lowermost when the brace is used as shown in Fig. 1 and the lower edge face of the floor joist 5 to brace the wall against inward bulging and also prevent or eliminate sag in the floor joist.

The threaded shaft is connected with the pressure pad 26 before it is screwed through threaded bore 31 of the adjusting nut 25 and before the shaft is screwed through this threaded opening an elongated metal sleeve 39 of tubular formation is slid longitudinally onto one of the brace sections and moved to such a position that space between the blocks will be exposed and the shaft may then be screwed into the threaded bore. The sleeve is then slid longitudinally to a position in which it fits about both of the brace sections, and since the diameter of this sleeve is such that it fits snugly about the two brace sections it will serve to maintain the brace sections in axial alignment with each other and very effectively reinforce the two brace sections. Openings 40 are formed in opposed relation to each other through the sleeve midway the length thereof and the sleeve is moved along the brace sections to a position in which the openings 40 are disposed between the blocks and the sleeve then turned to a position in which the openings are aligned with the opening 37 formed through the shaft diametrically thereof. The rod 38 may then be readily passed through the openings 37 and 40 until its end portions project from opposite sides of the sleeve and moved longitudinally to such a position that one or both ends may be conveniently grasped and the rod used as a handle for turning the shaft and thereby longitudinally adjusting the brace.

It will thus be seen that after the jack has been mounted in position for use, the shaft 32 may be turned by the handle 38 to shift the two sections 17 and 18 of the brace away from each other and exert desired pressure to the wall and to the lower surface of the floor joist.

When the jack is used during erection of new buildings a suitable number of jacks are applied to brace the wall against inward bulge and after the cement between the blocks 2 has set and all danger of collapse due to rain water, etc. ceases, the jacks are removed and stored until again needed or transported to another building where they are to be used.

When the improved jacks are used in connection with an old building to remove bulge from a wall and also eliminate sag in a floor, they may be left in place as a permanent fixture and thus very effectively eliminate wall bulge and sagging of a floor.

Instead of applying the jack to the wall as shown in Fig. 1, and suspending it from the floor joist 5 and the

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wall plate 6, it may be applied as shown in Fig. 5. Referring to this figure it will be seen that the jack has been inverted and set at rest upon a joist 40 extending horizontally between walls of the building with opposite ends abutting walls of the building. The joist is turned upright and its lower edge face rests flat upon the concrete floor 4. The end of the wall-engaging bar 8 carrying the anchoring strip 12 rests upon the upper edge face of the joist and the strip 12 bears against the confronting side face of the joist where it is secured by nails 13. The brace now extends downwardly from the wall-engaging bar in diverging relation thereto and the bracket 22 rests upon the upper side edge face of the joist with the side flange of the bracket overlapping a side face of the joist. Nails 24 are driven through the openings 23 in the bracket and into the joist and firmly secure the bracket to the joist. The brace is now extended longitudinally to force the bar tightly against the wall and the wall will be effectively braced against the inward bulge. By so disposing the jack the wall is braced from the floor to approximately the level of the ground instead of from the floor joist 5 to a point spaced upwardly from the floor 4, as shown in Fig. 1. In case it is desired to apply the jack to the wall before the concrete floor is poured, pegs 41 are driven into the ground and to these pegs are secured blocks 42 which are so located that when the joist 40 is set in place and supported by the pegs and the blocks, the joist will be spaced upwardly from the ground a distance corresponding to the thickness of the floor and concrete from which the floor is formed may be poured with the joists 40 and the jacks in place.

As this invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, the present embodiment is therefore illustrative and not restrictive, since the scope of the invention is defined by the appended claims rather than by the description preceding them, and all changes that fall within the metes and bounds of the claims or that form their functional as well as conjointly cooperative equivalents, are therefore intended to be embraced by those claims.

What is claimed is:

1. A bracing jack comprising an elongate bar, an elongate brace member, means coupling one end of the bar to one end of the brace member, said bar being designed to be positioned against one of two substantially right angularly related structures with its other end in close proximity to the other structure, said brace forming an acute angle with the bar, means carried by the said other end of the bar for securing it to said other structure, means carried by the said other end of the brace member for securing it to said other structure and spaced laterally from the said other end of the bar, means by which the brace member may be longitudinally extended after it and the bar have been secured to the said other structure, an elongate pin member secured at one of its ends to the said other end of the bar and extended a substantial distance laterally beyond the side of the bar which is remote from the brace member and providing means for suspending the bar.

2. A bracing jack comprising an elongate bar, an elongate brace member, means coupling one end of the bar to one end of the brace member, said bar being designed to be positioned against one of two substantially right

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angularly related structures with its other end in close proximity to the other structure, said brace forming an acute angle with the bar, means carried by the said other end of the bar for securing it to said other structure, means carried by the said other end of the brace member for securing it to said other structure and spaced laterally from the said other end of the bar, means by which the brace member may be longitudinally extended after it and the bar have been secured to the said other structure, said bar being of channel form having a back and side flanges, said coupling between the bar and brace member being a pivot provided by a pair of spaced ears carried by the flanges and between which the said one end of the brace member is positioned and a pivot pin extending through said ears and the interposed brace end, and said pivoted end of the brace member extending beyond the pivot pin and having an oblique end edge adapted to engage the back of the channel to limit outward swing of the brace member to a predetermined angular relation with the bar.

3. A jack for bracing a wall and a beam in right-angular relation therewith, said jack comprising an elongate bar adapted to position against a face of the wall, a longitudinally extensible brace member, the bar and brace member each having a free end, a pivot coupling between the other ends of the bar and brace members, means secured to and extending substantially at right angles from the free end of the bar on the side of the latter remote from the brace member for suspending the bar from the top of the wall and against the said face thereof, an elongate bracket rigidly secured to and across the free end of the brace member and forming an obtuse angle with the brace member for engagement against a face of the beam, means for facilitating securing the bracket to the beam, and means for effecting extension and shortening of the brace member.

4. The invention according to claim 3 with an apertured anchor strip secured to and extending longitudinally of and from the free end of the bar.

5. The invention according to claim 3 wherein said bracket comprises a length of angle bar material having one flange thereof directed away from the free end of the brace and lying substantially in the plane of a side of the brace.

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